

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application of  
Applicants : O'Hara et al.  
Serial No. : 10/628,318  
Filed : July 28, 2003  
Title: : SPATIALLY VARYING DIFFUSION MEDIA AND DEVICES  
INCORPORATING THE SAME  
Docket No. : GMC 0047 PA/40320.52  
Examiner : Tony Chuo  
Art Unit : 1746  
Conf. No. : 4444

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**EFS Web Electronic Submission**

April 30, 2007

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

For the reasons provided below, Applicants request review of the final rejection mailed January 29, 2007 in the above-identified application. This request for Pre-Appeal Brief Panel Review is being filed in conjunction with a Notice of Appeal.

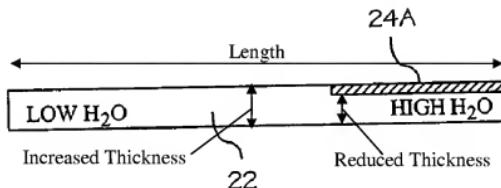
Claims 1-15, 17-22, 29-31, 33 and 38-39 were rejected under 35 U.S.C. 103(a) as being unpatentable over Isono et al (US 6,365,293) in view of Yasumoto et al (US 2003/0198860). Claims 23-25 were rejected under 35 U.S.C. 103(a) as being unpatentable over Isono et al in view of Yasumoto et al as applied to claims 1-15, 17-22, 29-31, 33 and 38-39 above and in further view of Fuglevand et al (US 6,939,636). Claims 26 and 27 were rejected under 35 U.S.C. 103(a) as being unpatentable over Isono et al in view of Yasumoto et al as applied to claims 1-15, 17-22, 29-31, 33 and 38-39 above and in further view of Zuber et al (US 2002/0041992). Claim 32 was rejected under 35 U.S.C. 103(a) as being unpatentable over Isono et al in view of Yasumoto et al as applied to claims 1-15, 17-22, 29-31, 33 and 38-39 above and in further view of Wood, III et al (US 6,350,539). Claims 34-37 were rejected under 35 U.S.C. 103(a) as being unpatentable over Isono et al in view of Yasumoto et al as applied to claims 1-15, 17-22, 29-31, 33 and 38-39 above and in further view of Johnson et al (US 5,840,438). Claims 40 and 41 were rejected under 35 U.S.C. 103(a) as being unpatentable over Isono et al in view of Yasumoto et al

as applied to claims 1-15, 17-22, 29-31, 33 and 38-39 above and in further view of Mussell et al (US 5,620,807). These rejections are respectfully traversed.

Independent claims 1 and 33

Independent claims 1, and 33 recite *inter alia*, that: 1) at least one of said first and second diffusion media substrate comprises an increased thickness portion and a reduced thickness portion and said mesoporous layer is carried along said reduced thickness portion of at least one of said first and second diffusion media substrates and/or 2) said mesoporous layer at least partially infiltrates at least one of said first and second diffusion media substrates to a depth of greater than zero  $\mu\text{m}$  to about 10 $\mu\text{m}$  in said high H<sub>2</sub>O regions and a depth of greater than 0  $\mu\text{m}$  to about 25 $\mu\text{m}$  in said low H<sub>2</sub>O regions

For example, and not by way of limitation, these claim elements may be illustrated in the Fig. 6 embodiment provided below:



As shown, the diffusion media substrate 22 may have a reduced thickness portion and an increased thickness portion), and the mesoporous layer 24A may be oriented along the reduced thickness portion. (page 6, lines 22-27).

Isono fails to teach or suggest a reduced thickness portion and an increased thickness portion along the length of the first or second diffusion media substrate. Referring to Fig. 6, Isono teaches a mesoporous layer along the entire substrate surface, not a mesoporous layer along a portion of the first or second media substrates as claimed. Noting this deficiency, the Examiner asserts that this claim element would be implicit from the teachings of Isono. Referring to Fig. 2 of Isono, the Isono device is a stacked structure having multiple fuel cell units 10 (or 100 as shown in Fig. 6). The stacked structure uses clamping plates 72, bolts 73, and nuts 74 to clamp the multiple fuel cell units 10 or 100 together. Based on this teaching, the Examiner

asserts that the gas diffusion layer 112 would comprise an increased thickness portion and a reduced thickness portion, because the reduced thickness portion of the gas diffusion layer is the portion of the gas diffusion layer 112 that is compressed by the separator plate and the increased thickness portion of the gas diffusion layer is the portion of the gas diffusion layer that is not compressed by the separator plate. (See Office Action 1/29/07, page 3).

However, there is no teaching in Isono that the gas diffusion layer is compressed when being placed in the stacked structure. Moreover, there is no teaching in Isono that the gas diffusion layer is compressed by the separator plates, and it is unclear how Examiner's discussion of clamps, nuts, and bolts leads one of ordinary skill in the art to believe that the gas diffusion layer is compressed by the separator plates. As the Examiner is aware, "one cannot base obviousness upon what a person skilled in the art might try or might find obvious but rather must consider what the prior art would have led a person skilled in the art to do." *In re Tomlinson*, 150 USPQ 623 (CCPA 1966). As shown in Fig. 6, Isono teaches a cell unit 100 with a gas diffusion layer 122 adjacent a separator plate 140; however, there is no teaching or suggestion that the separator plate 140 compresses the gas diffusion layer 122. Referring to Fig. 2, there is also no teaching or suggestion that stacking the cell units 10 (or 100) via clamps, bolts, and nuts results in compression of the gas diffusion layer of Isono. The cell units 10 contact one another in this stacked arrangement of Fig. 2; however, there is no teaching that the cells 10 are compressed in the stacking. Consequently, the Examiner's assertion that Isono implicitly teaches a diffusion media substrate comprising an increased thickness portion and a reduced thickness portion lacks support in Isono or any of the cited references.

Even if the gas diffusion layer was compressed as the Examiner asserts, there is no teaching of **a reduced thickness portion and an increased thickness portion along the length of the substrate** as recited in claims 1 and 33. If the Isono gas diffusion layer 122 was compressed, it would be compressed lengthwise, thereby reducing the *entire thickness* of the gas diffusion layer. By reducing the *entire thickness* of the gas diffusion layer, the compressed Isono gas diffusion layer 122 would have the *same thickness along its length*. As a result, Isono would still fail to teach a reduced thickness portion and an increased thickness portion along the length of the substrate as recited in the claims and as illustrated in Fig. 6 of the present application

provided above. Accordingly, Examiner's impermissible hindsight reconstruction of Isono fails to cure the deficiencies of Isono.

As the Examiner acknowledges, Isono also fails to teach or suggest that the mesoporous layer at least partially infiltrates at least one of the first and second diffusion media substrates to a depth of greater than zero  $\mu\text{m}$  to about 10 $\mu\text{m}$  in said high H<sub>2</sub>O regions and a depth of greater than 0  $\mu\text{m}$  to about 25 $\mu\text{m}$  in said low H<sub>2</sub>O regions as recited in claims 1 and 33. On page 8 of the 7/3/06 Office Action, the Examiner stated that Isono teaches an infiltration depth of zero. (See 7/3/06 Office Action, Page 8). In essence, the examiner recognized that Isono fails to teach infiltration of the mesoporous layer into the first or second substrates at a depth of greater than zero in the low and high H<sub>2</sub>O regions as claimed. As a result, Isono fails to teach an infiltration depth of **greater than zero**  $\mu\text{m}$  to about 10 $\mu\text{m}$  in said high H<sub>2</sub>O regions and a depth of greater than zero  $\mu\text{m}$  to about 25 $\mu\text{m}$  in said low H<sub>2</sub>O regions. Consequently, Isono fails to teach or suggest all elements of claims 1 and 33. The additional cited references fail to cure the above noted deficiencies of Isono. Accordingly, the rejections under §103 are respectfully traversed and claims 1, 33 and all claims dependent thereon are in condition for allowance.

The Examiner is encouraged to contact the undersigned to resolve efficiently any formal matters or to discuss any aspects of the application or of this response. Otherwise, early notification of allowable subject matter is respectfully requested.

Respectfully submitted,  
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